

Office Action Summary

Application No.

10/713,237

Applicant(s)

KHOSRAVI ET AL.

Examiner

GREG BENZON

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2444

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9,10,15,19,22 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-10, 15, 19, 22,25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>2/24/2010</u> . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

SUPPLEMENTAL

DETAILED ACTION

This application has been examined. Claims 9-10, 15, 19, 22,25 are pending. Claims 1-8, 11-14, 16-18, 20-21, 23-24 are cancelled. Claim 25 is submitted as a new claim.

Claims 9-10, 15, 19, 22,25 are currently rejected in the FINAL rejection mailed on 11/25/2009.

This supplemental action is being issued to clarify the prior art disclosure regarding Claim 25.

Making Final

Applicant's arguments filed 09/08/2009 have been fully considered but they are not persuasive.

The Examiner is maintaining the rejection(s) using the same grounds for rejection and thus making this action FINAL.

Priority

The effective date of the claims described in this application is November 13, 2003.

Response to Arguments

Applicant's arguments filed 09/08/2009 have been fully considered but they are not persuasive.

Everdell-Crump disclosed (re. Claim 25) *wherein each of the control card and the at least one forwarding card is configured to present an application programming interface for the functionality implemented on the other cards identical to an application programming interface the functionality implemented on the other cards would provide if implemented on the particular card.* (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, 'library of compiled code')

The Examiner interprets the limitation as per Applicant Specifications Page 8, Figure 3 as an abstraction layer between the *control card* (Crump-management control functions) and *forwarding card* (Crump- routing control functions) to implement messaging between said cards.

The Examiner notes that in Crump while the management control functions and the routing control function have been split, the two functions are still required to work together to implement the control plane, thus it would have been required for the two functions to communicate to each other. The API and the library of compiled code by

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Everdell enables the management control functions to be presented to the routing control functions and vice versa in Crump because the API enables one function to send and receive signals from the other. Everdell Paragraph 122 further disclosed an abstraction layer in the form of integrations points between the network devices ('the worker') and the NMS ('the master'). The said integration points by Everdell are equivalent to the abstraction layers because they enable messaging by Crump without requiring the Crump functions to be aware various network protocols that may be used to transport the messages through the routing fabric.

Everdell Paragraph 966 disclosed command interfaces wherein Paragraph 992 the command API provides a command interface abstraction.

Thus the Everdell integration interfaces enable Crump *to present an application programming interface for the functionality implemented on the other cards identical to an application programming interface the functionality implemented on the other cards would provide if implemented on the particular card.*

The Applicant presents the following argument(s) *[in italics]*:

By addressing the previous elements of the claims, the Examiner has disregarded the express elements of the pending claims.

The Examiner respectfully disagrees with the Applicant.

The Examiner presents the claim language as currently written. The Examiner notes while the claim language has changed the prior art fully disclosed the claim

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limitations. The prior art disclosed both software module functionality and the physical hardware embodying the limitations in the claims.

The Applicant presents the following argument(s) *[in italics]*:

[Everdell] does not address the connections among the functionality of the control plane protocol implemented on a control card and at least one forwarding card as recited in claim 15. For example, paragraph 109 references generic inter-process communication, not communication between cards. Paragraph 125 describes a database, not an API as cited by the Examiner. Paragraph 470 recites a library of code; however, there is no mention of any communication between cards.

The addition of Crump does not cure the deficiencies of Everdell. In particular, Crump describes a DRTM as a processor which broadcasts an update route message, for example. The DRTM sends this message over the control bus. That is, the communication between cards is not presented as a process on each card; rather the cards respond to messages over the control bus.

The Examiner respectfully disagrees with the Applicant.

Regarding the claim amendments, the Examiner interprets the limitation wherein *the functionality implemented on the other cards is presented to the functionality implemented on the card as a process running on the card* as implementation of a messaging interface or API for communication between the line cards.

Everdell-Crump disclosed (re. Claim 15) implementing a portion of the control plane protocol module that is separated from the core functionality (Crump-Figure 8, Column 4 Lines 55-65, 'The control plane is split into box management control functions and routing control functions.', Column 6 Lines 55-65) wherein the functionality implemented on the other cards is presented to the functionality implemented on the card as a process running on the card. (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, 'library of compiled code')

The Examiner notes that in Crump while the management control functions and the routing control function have been separated, the two functions are still required to work together to implement the control plane, thus it would have been required for the two functions to communicate to each other. The API and the library of compiled code by Everdell enables the management control functions to be presented to the routing control functions and vice versa in Crump because the API enables one function to send and receive signals from the other.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *communication between cards without cards responding to messages over the control bus*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9,10,15,19,22,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Everdell (US Publication 2002/0165961) further in view of Crump (US Patent 6999454).

As stated by the Applicant the first portion of functionality can be the forwarding plane update functionality (rarely distributed). A second portion can be the link specific functions (good candidate for distribution). A second portion can also include the protocol-specific functions given on Applicant Specifications page 9. Link specific functions, protocol-specific functions are described as distinct from forwarding plane update functions.

The Examiner interprets the limitation wherein *the functionality implemented on the other cards is presented to the functionality implemented on the card as a process running on the card* as implementation of a messaging interface or API for communication between the line cards.

Everdell disclosed (re. Claim 15) a system, comprising: a control card having a controller control plane protocol module (Everdell-Paragraph 166, 'master control driver MCD', Paragraph 577, 'Master SRM') to implement a core functionality of a control plane protocol module (Everdell-Paragraph 8, 'each distributed processor within the network device', Paragraph 10, Paragraph 145')

at least one forwarding card (Everdell-Paragraph 153) having a worker control plane protocol module (Everdell-Paragraph 577, 'local resiliency managers LRM')

a backplane to provide connectivity between the control card and the forwarding card; (Everdell-Paragraph 146, 'client out-of-band management channel ') and

wherein each of the control card and the at least one forwarding card is configured to discover other cards of the control card and the at least one forwarding card (Everdell-Paragraph 483)

wherein each of the control card and the at least one forwarding card is configured to obtain information about the functionality of the control plane protocol (Everdell-Paragraph 483) and to setup connections among the functionality of the control plane protocol implemented on the control card and the at least one forwarding card (Everdell-Paragraph 10, Paragraph 145)

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Everdell disclosed (re. Claim 15) wherein the functionality implemented on the other cards is presented to the functionality implemented on the card as a process running on the card. (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, 'library of compiled code')

Everdell-Crump disclosed (re. Claim 15) the control plane further comprising a controller control plane protocol module. (Everdell-Paragraph 166, 'master control driver MCD', Paragraph 577, 'Master SRM')

Everdell disclosed a network device having a distributed architecture may include an internal out-of-band control plane. Each of the distributed processors is connected to the out-of-band control plane, and the processors use the out-of-band control plane to transmit control information.

However Everdell did not disclose (re. Claim 15) implementing a portion of the control plane protocol module that is separated from the core functionality.

Crump disclosed (re. Claim 15) implementing a portion of the control plane protocol module that is separated from the core functionality (Crump-Figure 8, Column

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4 Lines 55-65, ' *The control plane is split into box management control functions and routing control functions.*', Column 6 Lines 55-65)

Everdell and Crump are analogous art because they present concepts and practices regarding the separation of network management control functions. At the time of the invention it would have been obvious to a person of ordinary skill in the networking art to combine Crump into Everdell. The motivation for said combination would have been to improve router scalability with respect to the control plane. (Crump-Column 6 Lines 35-40)

Everdell-Crump disclosed (re. Claim 15) implementing a portion of the control plane protocol module that is separated from the core functionality (Crump-Figure 8, Column 4 Lines 55-65, ' *The control plane is split into box management control functions and routing control functions.*', Column 6 Lines 55-65) wherein the functionality implemented on the other cards is presented to the functionality implemented on the card as a process running on the card. (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, 'library of compiled code')

The Examiner notes that in Crump while the management control functions and the routing control function have been split, the two functions are still required to work together to implement the control plane, thus it would have been required for the two functions to communicate to each other. The API and the library of compiled code by Everdell enables the management control functions to be presented to the routing

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control functions and vice versa in Crump because the API enables one function to send and receive signals from the other.

Everdell-Crump disclosed (re. Claim 9) the infrastructure module further comprising a namespace to allow registration of components of the infrastructure module. (Everdell-Paragraph 110, Paragraph 146)

Everdell-Crump disclosed (re. Claim 10) the infrastructure module further comprising a control plane protocol module registration module and a packet redirection module. (Everdell-Paragraph 110, Paragraph 112, Paragraph 146)

Everdell-Crump disclosed (re. Claim 19) a method of distributing processing in a network device, comprising: defining controller and worker control plane protocol modules (Everdell-Paragraph 8, 'each distributed processor within the network device') wherein the controller control plane protocol module implements a core functionality of a control plane protocol module on a control plane, and wherein the worker control plane protocol module implements a portion of the control plane protocol module that is separated from the core functionality on at least one forwarding plane; (Crump-Figure 8, Column 4 Lines 55-65, 'The control plane is split into box management control functions and routing control functions.', Column 6 Lines 55-65)

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developing corresponding entries in a communications library; (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, *'library of compiled code'*) implementing an infrastructure module, the communication library and the controller module on a control plane; (Everdell-Paragraph 6) and implementing the infrastructure module, the communication library and the worker modules on a forwarding plane. (Everdell-Paragraph 153)

Everdell-Crump disclosed (re. Claim 20) defining a controller and worker control plane protocol modules further comprising providing interfaces between the controller and worker modules. (Everdell-Paragraph 109, Paragraph 125, 'API')

Everdell-Crump disclosed (re. Claim 21) developing corresponding entries in a communications library further comprising developing instructions that, when executed, cause the controller and worker control plane protocol modules to communicate. (Everdell-Paragraph 146, *'client out-of-band management channel'*)

Claims 22 (article of computer readable media) are rejected on the same basis as Claims 15, 19 .

Everdell-Crump disclosed (re. Claim 25) *wherein each of the control card and*

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the at least one forwarding card is configured to present an application programming interface for the functionality implemented on the other cards identical to an application programming interface the functionality implemented on the other cards would provide if implemented on the particular card. (Everdell-Paragraph 109, Paragraph 125, 'API', Paragraph 470, 'library of compiled code')

The Examiner interprets the limitation as per Applicant Specifications Page 8, Figure 3 as a abstraction layer between the *control card (Crump-management control functions)* and *forwarding card (Crump- routing control functions)* to implement messaging between said cards.

The Examiner notes that in Crump while the management control functions and the routing control function have been split, the two functions are still required to work together to implement the control plane, thus it would have been required for the two functions to communicate to each other. The API and the library of compiled code by Everdell enables the management control functions to be presented to the routing control functions and vice versa in Crump because the API enables one function to send and receive signals from the other.

Everdell Paragraph 122, Paragraph 163 further disclosed an abstraction layer in the form of integrations points between the network devices ('the worker') and the NMS ('the master'). The said integration points by Everdell being equivalent to the abstraction layers because they enable messaging by Crump without requiring the Crump functions to be aware various network protocols that may be used to transport the messages through the routing fabric.

Everdell Paragraph 966 disclosed command interfaces wherein Paragraph 992 the command API provides a command interface abstraction.

Thus the Everdell integration interfaces enable Crump *to present an application programming interface for the functionality implemented on the other cards identical to an application programming interface the functionality implemented on the other cards would provide if implemented on the particular card.*

Conclusion

Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Bengzon whose telephone number is (571) 272-3944. The examiner can normally be reached on Mon. thru Fri. 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571)272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. B./

Examiner, Art Unit 2444

/William C. Vaughn, Jr./

Supervisory Patent Examiner, Art Unit 2444